

REMARKS

In the Office Action of January 23, 2006, the Examiner rejected claims 37-73 and 86-111. This response amends claims 47, 50, 65, 86, 90, 93, 100, and 107. Reconsideration of this application is respectfully requested.

Rejections—35 U.S.C. § 112

The Office rejected claims 37-46, 49-64, and 90-92 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

The Office asserts that the limitation, “substantially the same” in various claims, is not supported by the specification. Applicants respectfully traverse this rejection. Applicants submit herewith a Section 132 Declaration signed by Paul R. Sharps, one of the inventors of this application. The Declaration states that, in a chemical-vapor deposition process of the type described in this application, layer thicknesses are not “the same” because of variations caused by the deposition process. According to Mr. Sharps, “the nature of the deposition process inherently results in small variations both in composition and in thickness of each layer over the surface of the wafer.” Variations in thickness of 2-3 percent or more is normal and within manufacturing specifications. Therefore, it is not technically correct to state that the thickness or composition of two layers is “the same.” Those skilled in the art will understand the meaning of the term “substantially the same.” Applicants respectfully request the removal of this rejection.

The Office asserts that the limitation, “as least in part” in claim 46 is not supported by the specification. Applicants respectfully traverse this rejection. With reference to Figure 1,

the buffer layer of the bottom cell is shown as GaAs. The Office asserted that Ge cell 104 does not contain GaAs. However, the first cell referred to in claim 46 refers to the first solar cell 103, not the substrate 104. The bottom layer of cell 103 is GaAs. Applicants respectfully request the removal of this rejection.

The Office asserts that the limitation, "at least in part" in claim 49 is not supported by the specification. For the same reasons stated above, Applicants assert that Figure 1 supports claim 49.

The Office asserts that the limitation, "substantially the same composition and thickness" in claim 50 is not supported by the specification. Applicants refer to the Section 132 Declaration referenced above. Applicants assert that claim 50 is supported by the specification.

The Office asserts that the limitation, "at least one of the solar cell is fabricated at least in part with GaAs" in claim 52 is not supported by the specification. For the same reasons stated above, Applicants assert that Figure 1 supports claim 52.

The Office asserts that the requirement in claim 90 that the top layer of the top cell have a first polarity and the bottom layer of the bypass diode have said first polarity is not supported by the specification. Applicants respectfully traverse this rejection. With reference to Figure 8, the top layer of the top cell is n-type window layer 846 (see page 16, lines 24-28). The bottom layer of the bypass diode is n-type layer 860 (see page 17, lines 9-11). Therefore, the bottom layer of the bypass diode and the top layer of the top cell both have a first polarity. Applicants respectfully request the removal of this rejection.

The Office asserts that the phrase, “at least one layer” in claim 90 is not supported by the specification. Applicants respectfully traverse this rejection. As shown in Figure 8, bypass diode 620 comprises, *inter alia*, elements 860, 862, and 864. Applicants assert that each of elements 860, 862, and 864 comprise a layer. Therefore, the bypass diode comprises “at least one layer.” Applicants respectfully request the removal of this rejection.

The Office asserts that the phrase, “at least in part” range for the GaAs in claim 92 is not supported by the specification.

The Office rejected claims 37-46 and 50-64 under 35 U.S.C. § 112, second paragraph as “being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.” The Office states that it is not clear what is to be encompassed by the term “substantially the same thickness.” Applicants assert that the term “substantially the same thickness” refers to the fact that each layer in the sequence of semiconductor layers in the bypass device and have the same composition and thickness as the corresponding layer in the subcell. Applicants assert that the claims as amended have clarified this relationship and respectfully request the removal of this rejection.

The Office states that claim 50 is indefinite because it is not clear which of the plural subcells is being referred to by the term “the subcell.” Applicants assert that claim 50 as amended meet the requirements of section 112.

Rejections—Section 102

The Office rejected claims 47-49, 90-93, 95-98, 107, and 110 under 35 U.S.C. § 102(e) as being anticipated by Boutros (U.S. Patent 6,635,507). Applicants respectfully traverse this rejection.

In addition to the reasons listed in our response of May 20, 2005 and November 4, 2005 (which are hereby incorporated by this reference), Applicants wish to reiterate that the integral bypass diode in Boutros protects an adjacent semiconductor cell, NOT the same cell on which the bypass diode is integrated. *See, e.g.*, Col. 6, line 56 to Col. 7, line 12; Col. 7, line 31 to Col. 7, 46 (“Figure 7 illustrates *the* interconnection schema used by the present invention”); and Figures 5 and 7 of Boutros. Thus, if there was not an array of cells, but only one solar cell, the bypass diode of Boutros would not be connected to that solar cell, and thus the bypass diode disclosed in Boutros would not function to protect the sole solar cell.

The Office points to Figure 9 as being a schematic of Figure 8. However, the specification is not clear on that point. Only four lines are spent on Figure 9. In contrast, several paragraphs (listed above) are used to describe how the bypass diode protects adjacent cells. Applicants thus assert that it is not clear that Figure 9 refers to a bypass diode protecting the same cell.

In addition, the Office points to Figure 8 of Boutros for the assertion that the top layer of the top cell and the bottom layer of the bypass diode have the same polarity. The Office points to element 808 (with a polarity of N++) as being the bottom layer of the bypass diode. Applicants wish to point out that element 808 is not the bottom layer of the bypass diode. At column 7, lines 47-53, the bypass diode is element 810. Element 808 is described as merely

an “isolation layer.” While the Office points to Figures 2A, 3A, and 4A as showing a bottom layer of a bypass diode with the same polarity as the top layer of the solar cell, it is evident that Figures 2A, 3A, and 4A merely show an abstracted view of the idea of the Boutros invention with different connection strategies—the actual Boutros invention is shown in Figure 8A (see Column 7, line 47, “Figure 8 illustrates a completed structure in accordance with the present invention.”).

The Office also states that “the Ge substrate (802) forms an electrical connection path between the multijunction solar cell and the bypass diode.” Applicants again wish to point the Office to the paragraph starting at column 6, line 56 and to Figure 5, which clearly state (and show) that the bypass diode of the Boutros invention is connected to the *adjacent* solar cell, effectively *teaching away* from the present invention.

Applicants assert that Boutros fails to anticipate claims 47-49, 90-93, 95-98, 107, and 110 and respectfully request the removal of this rejection.

The Office rejected claims 47-68, 70, and 86-111 under 35 U.S.C. § 103(a) as being unpatentable over Boutros. Applicants traverse this rejection for the reasons stated above with respect to the section 102 rejections based on Boutros.

Rejections—JP ‘397 Reference

The Office rejected claims 47, 48, 65, 66, 68, 69, 86, 87, 89-91, 93, 95, 97-101, 103, 104, and 106-108 under § 102(b) as being anticipated by JP 9-64397 (“‘397 reference”). Applicants respectfully request the removal of this rejection. Applicants assert that claims 47,

48, 65, 66, 68, 69, 86, 87, 89-91, 93, 95, 97-101, 103, 104, and 106-108, as amended, are patentable over the cited references.

Rejections—Ho

The Office rejected claims 47-57, 59, 61, 65-68, 70, 86-111 under § 102(b) as being anticipated by Ho et al., WO 99/62125. Applicants respectfully request the removal of this rejection. Applicants assert that claims 47-57, 59, 61, 65-68, 70, 86-111, as amended, are patentable over the cited references.

Rejections—Section 103

The Office rejected claims 47-68, 70, and 86-111 as being unpatentable over Boutros in view of Ho. Applicants respectfully traverse this rejection.

For the reasons stated above with respect to both Boutros and Ho, applicants assert that claims 47-68, 70, and 86-111 are all patentable over Boutros and Ho.

Double Patenting

The Office rejected claims 37-73 and 86-111 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over U.S. Patent 6,864,414.

The Office provisionally rejected claims 47-59, 61, 65-68, 70, and 90-111 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over application serial number 10/723,456.

The Office rejected claims 47-59, 61, 65-68, 70, and 90-111 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over U.S. Patent 6,680,432.

The Office provisionally rejected claims 37-73 and 86-111 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over application serial number 11/247,828.

The Office provisionally rejected claims 37-73 and 86-111 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over application serial number 10/336,247.

The Office provisionally rejected claims 37-73 and 86-111 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over application serial number 11/280,379.

The Office rejected claims 37-73 and 86-111 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over U.S. Patent 6,600,100.

The Office rejected claims 37-73 and 86-111 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over U.S. Patent 6,278,054.

Applicants submit herewith terminal disclaimers that address each of the patents and applications listed above. Applicants respectfully request the removal of these rejections.

CONCLUSION


If there are any additional charges concerning this response, please charge to White & Case LLP Deposit Account 50-3672.

A favorable consideration of the present amendment together with the original application is respectfully requested.

Respectfully submitted,

Dated: June 23, 2006

By:



Thomas V. DelRosario, Reg. No. 46,658
WHITE & CASE LLP
1155 Avenue of the Americas
New York, NY 10036
(650) 213-0345